

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claims 1-35 (Canceled)

Claim 36 (Currently amended): A test apparatus for testing an electronic device, said test apparatus comprising:

a ~~flexible~~ contactor comprising first and second opposing surfaces and a first plurality of terminals disposed on said first surface; and

an interposer comprising:

a substrate ~~that is a single block structure,~~

a first plurality of elongate, resilient contact elements extending from a first side of said ~~substrate~~ single block structure, ones of said first plurality of contact elements ~~corresponding to~~ are aligned with ones of said first plurality of terminals, and

a second plurality of elongate, resilient contact elements extending from a second side of said ~~substrate~~ single block structure, ones of said first plurality of contact elements being electrically connected to ones of said second plurality of contact elements,

wherein ~~application of a pressure to said second surface of said contactor brings about electrical connections between ones of said first plurality of terminals on said contactor and ones of a second plurality of terminals on said electronic device through~~ ones of said first plurality and second plurality of contact elements are disposed in a pattern that corresponds to a pattern of ones of a plurality of second terminals on said electronic device, and said ones of said second plurality of contact elements are configured to directly contact and thereby make electrical connections with said ones of said second terminals.

Claim 37 (Previously presented): The test apparatus of claim 36, wherein each of said contact elements of at least one of said first plurality of contact elements and said second plurality of contact elements are lithographically formed.

Claim 38 (Previously presented): The test apparatus of claim 37, wherein each of said contact elements of said first plurality of contact elements and said second plurality of contact elements are lithographically formed.

Claim 39 (Previously presented): The test apparatus of claim 36, wherein each of said contact elements of at least one of said first plurality of contact elements and said second plurality of contact elements comprise a cantilever beam.

Claim 40 (Previously presented): The test apparatus of claim 39, wherein each of said contact elements of said first plurality of contact elements and said second plurality of contact elements comprise a cantilever beam.

Claim 41 (Previously presented): The test apparatus of claim 75, wherein said first plurality of contact elements are disposed on said first side of said substrate at a first pitch, and said second plurality of contact elements are disposed on said second side of said substrate at a second pitch different than said first pitch.

Claim 42 (Previously presented): The test apparatus of claim 36, wherein said substrate is flexible.

Claim 43 (Previously presented): The test apparatus of claim 36, wherein said substrate comprises silicon.

Claim 44 (Previously presented): The test apparatus of claim 36 further comprising an electronic component disposed on said substrate.

Claim 45 (Previously presented): The test apparatus of claim 44, wherein said electronic component is disposed between ones of said contact elements.

Claim 46 (Previously presented): The test apparatus of claim 44 further comprising a plurality of said electronic components.

Claim 47 (Previously presented): The test apparatus of claim 46, wherein at least one of said plurality of electronic components is disposed on said first side of said substrate between ones of said first plurality of contact elements, and at least another of said plurality of electronic components is disposed on said second side of said substrate between ones of said second plurality of contact elements.

Claim 48 (Previously presented): The test apparatus of claim 36, wherein said ones of said first plurality of contact elements are compressed against said ones of said first plurality of terminals.

Claim 49 (Previously presented): The test apparatus of claim 48 further comprising a stop structure for limiting compression of said first plurality of contact elements.

Claim 50 (Previously presented): The test apparatus of claim 36 further comprising a stop structure for limiting compression of said second plurality of contact elements

Claim 51 (Previously presented): The test apparatus of claim 36, wherein said contactor comprises an integrated circuit.

Claim 52 (Previously presented): The test apparatus of claim 51, wherein said contactor comprises a plurality of integrated circuits.

Claim 53 (Previously presented): The test apparatus of claim 51, wherein said first plurality of terminals are disposed on said integrated circuit.

Claim 54 (Previously presented): The test apparatus of claim 51, wherein said integrated circuit comprises circuitry for testing said electronic device.

Claim 55 (Previously presented): The test apparatus of claim 79, wherein said semiconductor device is an unsingulated wafer.

Claim 56 (Previously amended): The test apparatus of claim 79, wherein said semiconductor device comprises a plurality of singulated dies.

Claim 57 (Previously presented): The test apparatus of claim 36, wherein said contactor comprises a plurality of tile substrates.

Claim 58 (Previously amended): A test apparatus for testing an electronic device, said test apparatus comprising:

- a contactor comprising a first plurality of terminals;

- an interposer comprising:

- a substrate,

- a first plurality of elongate, resilient contact elements extending from a first side of said substrate, and

- a second plurality of contact elements corresponding to a second side of said substrate, ones of said first plurality of contact elements being electrically connected to ones of said second plurality of contact elements; and

means for attaching said interposer to said contactor such that at least one of said contactor or said interposer is moveable between a first position and a second position while said interposer is attached to said contactor,

wherein in said first position, said first plurality of contact elements do not contact said first terminals on said contactor, and

in said second position, said first plurality of contact elements contact said first terminals on said contactor and said first plurality of contact elements and said second plurality of contact elements provide electrical connections from said first terminals on said contactor to a second plurality of terminals on said electronic device.

Claim 59 (Canceled)

Claim 60 (Previously presented): The test apparatus of claim 58, wherein each of said contact elements of at least one of said first plurality of contact elements and said second plurality of contact elements are lithographically formed.

Claim 61 (Previously presented): The test apparatus of claim 58, wherein each of said contact elements of at least one of said first plurality of contact elements and said second plurality of contact elements comprise a cantilever beam.

Claim 62 (Previously presented): The test apparatus of claim 76, wherein said first plurality of contact elements are disposed on said first side of said substrate at a first pitch, and said second plurality of contact elements are disposed on said second side of said substrate at a second pitch different than said first pitch.

Claim 63 (Previously presented): The test apparatus of claim 58, wherein said substrate is flexible.

Claim 64 (Previously presented): The test apparatus of claim 58, wherein said substrate comprises silicon.

Claim 65 (Previously presented): The test apparatus of claim 58 further comprising an electronic component disposed on said substrate.

Claim 66 (Previously presented): The test apparatus of claim 65, wherein said electronic component is disposed between ones of said contact elements.

Claim 67 (Previously presented): The test apparatus of claim 65 further comprising a plurality of said electronic components.

Claim 68 (Previously presented): The test apparatus of claim 67, wherein at least one of said plurality of electronic components is disposed on said first side of said substrate between ones of said first plurality of contact elements, and at least another of said plurality of electronic components is disposed on said second side of said substrate between ones of said second plurality of contact elements.

Claim 69 (Previously presented): The test apparatus of claim 58, wherein said first plurality of contact elements are compressed while said ones of said second plurality of terminals on said electronic device are pressed against said ones of said second plurality of contact elements.

Claim 70 (Previously presented): The test apparatus of claim 69 further comprising a stop structure for limiting compression of said first plurality of contact elements.

Claim 71 (Previously presented): The test apparatus of claim 58, wherein said contactor comprises an integrated circuit.

Claim 72 (Previously presented): The test apparatus of claim 71, wherein said contactor comprises a plurality of integrated circuits.

Claim 73 (Previously presented): The test apparatus of claim 71, wherein said first plurality of terminals are disposed on said integrated circuit.

Claim 74 (Previously presented): The test apparatus of claim 71, wherein said integrated circuit comprises circuitry for testing said electronic device.

Claim 75 (Previously presented): The apparatus of claim 36, wherein said first plurality of elongate, resilient contact elements is disposed on said first side of said substrate, and said second plurality of elongate, resilient contact elements is disposed on said second side of said substrate.

Claim 76 (Previously presented): The apparatus of claim 58, wherein said first plurality of elongate, resilient contact elements is disposed on said first side of said substrate, and said second plurality of contact elements is disposed on said second side of said substrate.

Claim 77 (Previously presented): The apparatus of claim 58, wherein said contactor further comprises an interface to a host controller.

Claim 78 (Previously presented): The apparatus of claim 83, wherein said base is further configured to move said electronic device such that said ones of said second plurality of terminals on said electronic device are moved out of contact with said ones of said second plurality of contact elements.

Claim 79 (Previously presented): The test apparatus of claim 36, wherein said electronic device comprises a semiconductor device.

Claim 80 (Previously amended): The test apparatus of claim 79, wherein said electronic device comprises a semiconductor wafer comprising a plurality of unsingulated dies.

Claim 81 (Previously presented): The apparatus of claim 58, wherein said electronic device comprises a semiconductor device.

Claim 82 (Previously presented): The apparatus of claim 36 further comprising a base for supporting said electronic device.

Claim 83 (Previously presented): The apparatus of claim 58 further comprising a base for supporting said electronic device.

Claim 84 (Previously amended): A test apparatus comprising:

a first substrate;

an interposer substrate;

a first plurality of elongate, resilient contact elements extending from a first surface of said interposer substrate and disposed to contact said first substrate;

a second plurality of elongate, resilient contact elements extending from a second surface of said interposer substrate, wherein said second surface is opposite said first surface and said second plurality of elongate, resilient contact elements are disposed in a pattern that corresponds to a pattern of contact points on an electronic device to be tested,

wherein application of a pressure directly to said first substrate causes ones of said second plurality of elongate, resilient contact elements to contact corresponding ones of said contact points on said electronic device to be tested.

Claim 85 (Previously presented): The test apparatus of claim 84, wherein said electronic device is a semiconductor device.

Claim 86 (Previously presented): The test apparatus of claim 85, wherein said semiconductor device is an unsingulated semiconductor wafer comprising a plurality of dies.

Claim 87 (Previously presented): The test apparatus of claim 84, wherein said first plurality of elongate, resilient contact elements are electrically conductive springs.

Claim 88 (Previously presented): The test apparatus of claim 87, wherein said second plurality of elongate, resilient contact elements are electrically conductive springs.

Claim 89 (Previously presented): The test apparatus of claim 84 further comprising a base for supporting said electronic device.

Claim 90 (New): The test apparatus of claim 84, wherein removal of said pressure from said first substrate breaks said contact between said ones of said second plurality of contact elements and said corresponding ones of said contact points on said electric device.

Claim 91 (New): The test apparatus of claim 84, wherein said interposer substrate is a single block structure.

Claim 92 (New): The test apparatus of claim 92, wherein said first plurality of contact elements are attached to and extend from said first surface of said interposer substrate, and said second plurality of contact elements are attached to and extend from said second surface of said interposer substrate.

Claim 93 (New): The test apparatus of claim 58, wherein, while said interposer is attached to said contactor, said interposer can be moved from said first position to said second position by application of forces to ones of said second plurality of contact elements.

Claim 94 (New): The test apparatus of claim 93, wherein, while said interposer is attached to said contactor, removal of said forces from said second plurality of contact elements results in said interposer moving from said second position to said first position.

Claim 95 (New): The test apparatus of claim 58, wherein, while said interposer is attached to said contactor, said interposer can be moved from said first position to said second position by pressing ones of said second plurality of terminals on said electronic device against said ones of second plurality of contact elements.

Claim 96 (New): The test apparatus of claim 58, wherein said substrate is a single block structure.

Claim 97 (New): The test apparatus of claim 96, wherein said first contact elements are attached to and extend from said first side of said block structure, and said second contact elements are attached to and extend from said second side of said block structure.

Claim 98 (New): The test apparatus of claim 41, wherein said second pitch is less than said first pitch.

Claim 99 (New): The test apparatus of claim 36, wherein said first contact elements are attached to and extend from said first side of said block structure, and said second contact elements are attached to and extend from said second side of said block structure.

Claim 100 (New): The test apparatus of claim 36, wherein:

said contactor is flexible, and

application of a pressure to said second surface of said contactor brings about electrical connections between ones of said first plurality of terminals on said contactor and ones of a second plurality of terminals on said electronic device through ones of said first plurality and second plurality of contact elements